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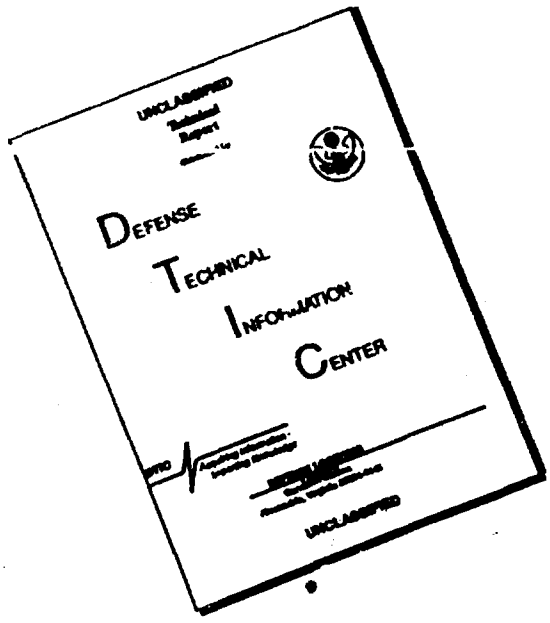

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PROTECTION AND DEFENSE OF THE POPULATION AGAINST BACTERIAL WEAPONS

by

I. BEZDENEZHNYKH and YE. TYRKOVA

PREFACE

The Communist Party and the Soviet government will persistently pursue a policy promoting peace and preventing war. The Program of the Party states: "together with other socialist countries, peace-loving governments and nations, to utilize all means for the prevention of world war from society's life..."

Piously executing the testament of the Great Lenin on the peaceful coexistence of states of different social systems, together with the socialist states and peace-loving nations, our country consistently struggles to find a solution of those important international problems upon which the maintenance and consolidation of peace depend; we make efforts to prohibit all means of mass destruction -- the nuclear, chemical, and bacterial weapons. Under various pretexts, however, aggressive circles of many capitalist states ignore pressing international problems and reinforce the armament race.

As long as the problem of universal and full disarmament under strict international control remains unsolved and war has not departed from the life of mankind forever, improving the defense of our country remains one of our most important tasks. The role of Civil Defense is extremely large in the accomplishment of this task. Timely training and high-quality organization of the population are unfailing conditions for reliable protection against bacterial attack.

The appearance of the rocket propelled nuclear weapon has pushed the danger of bacterial warfare into the background of the imaginations of many people. However, the

threat that aggressive circles of imperialist states may use lethal microbes and their toxins for military purposes has not been removed. Following the orders of their masters, certain groups of scientists have continued their investigations into the use of pathogenic microbes for military purposes, despite the efforts of progressive mankind to prohibit bacterial weapons as instruments of mass annihilation. Discoveries in this field are continually being reported in the literature published in many foreign countries.

Aggressive circles of many capitalist states have accepted the bacterial weapon for their armament. This is possibly because it has a high degree of damaging capacity, its injurious action is persistent and lasting, it is suitable for a covert use on a large scale, and microbes and toxins used in an attack are very difficult to detect.

At present, the properties and injurious effects of bacterial weapons are being studied, as well as reliable methods for protection from bacterial weapons which are accessible to the population.

I. BACTERIAL WEAPONS AND METHODS OF THEIR USE

The Concept of Bacterial Weapons

Bacterial weapon is an accepted term for pathogenic microbes and their toxins placed in different technical devices (rockets, projectiles, bombs, and so on) and intended for the infection of people, animals, and plants. In the foreign literature the wider concept of "biological weapon" is often employed.

In addition to microbes and toxins, the damaging means may include arthropods (insects, mites, and ticks), so-called plant hormones or substances which kill plants, and also contaminated animals (rodents). Consequently, bacteriological or biological warfare is the artificial, intentional dissemination of infectious diseases.

To understand the injurious properties of the bacterial weapon, one should have a correct understanding of microbes, the agents of infectious diseases, and of the pathways of the spread of infectious diseases among peoples and animals. Microbes are the smallest living beings, invisible by the naked eye. They can be examined only with the aid of microscopes at hundredfold and thousandfold magnifications. Under favorable conditions, microbes multiply very rapidly: the average microbic cell divides into two daughter cells every 15-30 minutes. Each of the daughter cells subsequently divide into two cells, and so on. With such enormous propagation, one microbic cell can produce a hundred million new cells of microbes in a few hours.

During multiplication or death, microbes excrete toxic substances, which are called toxins. Some of the toxins are extremely poisonous, and even minute amounts can kill a man if they get into his organism. Pathogenic (disease-forming) microbes usually multiply in the human or animal organism. Many of them are able to stay outside the organism for some time, in air, water, food, or various objects, and they can grow on artificial nutrient media.

The agent of disease penetrates from an infected organism to a healthy one by various routes. For instance, the agents of influenza, measles, and diptheria are transmitted through the air; microbes causing dysentery, typhoid fever and cholera are transmitted in water, food products, clothing, and contaminated hands. They are sometimes carried by flies and other insects; exanthematic typhus is transmitted by lice and the agent of malaria by mosquitoes.

Infectious diseases whose agents may be transmitted by air, water, food products, and by bloodsucking arthropods (lice, fleas, mosquitoes, ticks, and so on) can be spread especially quickly.

Human history has dramatic examples of the miraculously rapid spread of many infectious diseases. Epidemics of plague and cholera which broke out in the past carried away millions of lives.

It was therefore not without deliberation that aggressive circles of many capitalist states accepted the bacterial weapon as one of their most powerful means of destroying people, despite the fact that it is prohibited by international law and condemned by all of progressive mankind.

Possible Bacterial Means of Inflicting Damage

Foreign investigators feel that not all agents of known diseases can be employed as means of inflicting damage. In their opinion, agents which are suitable for bacterial warfare must possess a so-called "combat effectiveness." This is characterized by several features: the pathogenicity (disease-forming capacity) of the microbe, its survival rate in an external medium, its ability to grow an artificial nutrient media, its ability to provoke serious ailments soon after its penetration into human and animal organisms and so on. Moreover, preference is given to microbes which can be transmitted through the air and which can cause a quickly spreading disease. The most effective are agents of infectious diseases against which no specific prevention

(immunization) can be applied and no modern means of treatment can be employed.

In evaluating the properties of pathogenic agents, foreign authors reached the conclusion that the following ones can be used as bacterial means of destruction: --1. agents of diseases dangerous only for man: --agents of cholera, typhoid and paratyphoid fevers, exanthematic typhus, Rocky Mountain spotted fever, tsutsugamushi fever, yellow fever, natural smallpox, and the agents of many others; 2. agents of infectious diseases of both animals and man: -- plague, tularemia, brucellasis, anthrax, glanders, melioidosis (pseudo-glanders), Q-fever, ornithosis, equine encephalomyelitis, foot and mouth disease, and others; 3. agents of infectious diseases dangerous only to animals: --cattle plague, swine fever, hemorrhagic septicemia of cattle, Asiatic pseudo-plague of birds, mycotoxicosis, and others; 4. agents of diseases of agricultural crops: --wheat rust and rye smut, potato wilting, tobacco mosaic disease, and tomato mosaic disease, mycotic diseases of rice, of cotton, and the agents of some other ailments.

The foreign literature also pays much attention to botulism toxin, and, to a lesser degree, to other toxins of microbic origin.

In recent years the opinion has been persistently expressed that microbes of variable properties can be used in bacterial warfare. Analysis of materials published in the foreign literature shows that microbes which have increased pathogenicity, high degree of survival in the external environment (in the air, water, soil, food products, on household objects, and so on) and are resistant to medicinal and disinfecting agents can indeed be obtained.

The possibility of using microbes in mixtures or so-called formulas should not be omitted. According to the foreign literature, a formula may include agents of several infectious diseases, or agents of many ailments, together with toxic

substances of bacterial and synthetic origin. Formulas can be used which contain only bacterial toxins. The above statements deserve attention from various points of view. It is well known that mixed human infections have a more severe course, are more often associated with complications, and have a fatal outcome in a large percentage of cases. Consequently, in presence of a simultaneous infection with agents of several diseases, or with agents and bacterial toxins, a serious case, and perhaps a perversion, of the disease should be expected. It will therefore, be very difficult to recognize the diseases and to detect the microbes and toxins which have been employed.

Modern microbiological technology makes it possible to accumulate microbes and toxins in huge quantities, and to store them in the form of liquid (suspensions) and powder (dry) formulas. Microbes can preserve their properties especially long in the dried condition.

In connection with this, the foreign literature speaks of the possibility of obtaining highly concentrated formulas which contain many billions of microbic bodies, or doses of bacterial toxin, in 1.0 ml or in 1.0 g. It has been calculated that one mm^3 of triturated chick-embryo tissue used for the cultivation of psittacosis virus is enough to infect several million people.

Properties of Bacterial Weapons

As is true of other mass-damage weapons, the bacterial weapon is highly effective. First of all, very small amounts of microbes and their toxins are able to produce ailments in human beings and in animals. A man becomes sick with plague due to a few, perhaps only one, plague microbe.

When the damage-inflicting properties of the bacterial weapon are evaluated, the ability of many diseases to spread from man to man must be also kept in mind. The persons who are bacterially infected may further infect their environ-

ment. An infectious disease which arises as a result of this may reach a wide epidemic proportions. The population should therefore know how to isolate patients with infectious diseases, how to care for them, and how to defend themselves against infection.

Relative stability and sizeable duration of action is characteristic of the bacterial weapon.

Cases of illness may be reported a long time after the use of the bacterial weapon. This is related to many factors. Pathogenic (disease forming) microbes are able to survive for a long time in the environment outside the organism (water, food products, soil, vegetation, household objects, and so on). This is especially true for the spores which are formed by a few microbic types. Thus, anthrax spores may be preserved in the soil for several years. It is clear that the consumption of contaminated water or food articles, or the contact with objects, with vegetation, and soil where viable microbes remained, can lead to infection a long time after the employment of the bacterial weapon. In many cases, the stability of the bacterial weapon may be conditioned by preservation of the pathogenic agents in insects and lice.

One of the important properties of the bacterial weapon is the existence of a hidden (incubational) period. In other words, the bacterial means may not produce ailment immediately, but after some time. This is a characteristic feature of infectious diseases even under ordinary conditions. Many persons know from their own experience that a healthy child who was in contact with a child who had diphtheria, measles, pertussis, or some other infectious diseases does not get ill until several days after infection. The length of the latent period is different for different diseases. Various factors can shorten or lengthen the latent period.

One of the essential properties which characterize the effectiveness of the bacterial weapon is the complicated nature of the diagnosis (recognition) of ailments, and the

difficulty of detection, i.e., the determination of the species of employed microbe.

Methods of Employing Bacterial Means of Destruction

The technical equipment of modern armies permits the use of bacterial means with aviation, rockets, self-propelled missiles, artillery, mortars, and other technical means.

Foreign specialists feel that one of the most feasible and most effective methods of a bacterial attack is the contamination of near-earth layers of the atmosphere with dry or liquid formulas containing agents of infectious diseases and bacterial toxins. This is not just a coincidence. Microbes and toxins dropped into the near-earth layer of the atmosphere as bacterial cloud or aerosol can be transferred over great distances; they can penetrate into localities, settle down on the surface of the ground, of plants, walls, and roofs of buildings, they can drop on clothes, on visible mucous membranes, on human skin, into water, food products, and so on. The smallest breeze (wind, a draft in the room), even the stirring of things will scatter the bacterial aerosols which sedimented on various objects. Bacterial means of infection contained in air are able to penetrate quickly and in large amounts into the organisms of man and animals. Large groups of people can be infected simultaneously with practically all agents and toxins chosen by the aggressors as bacterial means of contamination. Since microbes and toxins drop from the air into water, food products, and other objects, people and animals can become infected not only by breathing, but also through their skin, mucous membranes, and gastrointestinal tract.

Many foreign investigators concentrate their attention on diversionary methods of using bacterial means of infection. The opinion is frequently expressed that targets of diversion can be places of large gathering of people (railway stations, airports, assembly halls, moving picture theaters, subway stations, shelters, and so on), industrial enterprises,

water-supply sources (water conduits, wells, ponds, water tanks, and so on), food warehouses, and so on.

Moreover, insects and ticks can be used for the infection which can be dispersed from airplanes, ships, or submarines, or with the aid of aerial bombs of special constructions. The Japanese once paid much attention to this method of employing bacterial means of destruction. Of course, the use of bacterial means of destruction simultaneously in several ways and in various combinations cannot be excluded.

Targets of a Bacterial Attack

In the foreign literature the opinion is expressed that the bacterial weapon will initially be aimed at civilian population and at the enemy's forces.

Moreover, it is supposed that bacterial means can be employed for attacks on sea and air bases, cities, industrial and agricultural districts, Army camps and centers of troop preparation.

However, the use of bacterial weapon for troops is very unlikely if the belligerent armies are in contact.

Effect of Various Factors Upon the Striking Action of Bacterial Weapons.

Foreign specialists believe that the effectiveness of the bacterial weapon will be determined by many factors. First, it will be determined by the selection of the site of attack. Here, meteorological conditions, configuration of the ground, density of population, sanitary status, and readiness for an antibacterial defense are considered. Second, the effectiveness will depend upon the selection of attack time. In a certain case, both the meteorological conditions and the nature of the activity of the population (work in closed rooms, staying in open places, and so on) is taken into consideration. Third, the effectiveness depends upon the suddenness and the secrecy of employment of bacterial means as formulas (mixtures). Fourth, it depends upon the wide utilization of the bacterial weapon, and upon the creation of a required

concentration of bacterial means of destruction in the atmosphere.

Together with other factors, meteorological conditions deserve attention. The bacterial weapon may be used any time of the year. However, it is thought that it is most effective in cold weather. At low temperatures microbes preserve their viability in the external environment for a longer time. For this reason alone, the duration of action of the bacterial weapon will be extended considerably. This can subsequently influence the rate of infection of people and animals.

Moreover, the fact that people stay longer in closed rooms in cold weather also promotes the rapid spread of infectious diseases. Epidemics of pulmonary plague most often originate during the cold season; this is explained by the close contact of people in closed rooms. Outbreaks of such other infectious diseases as exanthematic typhus fever, are also observed more often in winter.

The stability, spread along the terrain, and consequently the damaging capacity of a bacterial aerosol in the near-earth layer of the air, is greatly influenced by meteorological conditions, especially by the strength and direction of the wind, the aerial vertical stability, aerial humidity, and insolation.

It is clear that the stronger the wind, the quicker the dispersion of a bacterial cloud. Everyone knows from his own experience that in calm weather smoke which forms at the firebox of a stove, especially in a village located in lowland, rises above the houses, but in windy weather, it is quickly carried away beyond the boundaries of the village. The behavior of an aerosol cloud and of smoke is similar.

The effect of the vertical stability of the atmosphere upon the concentration of bacterial aerosol becomes understandable if we consider that warm air quickly rises from the ground surface up to the higher layer of the atmosphere,

dragging microbes and dust particles with it.

The atmosphere also quickly gets rid of microbes when humidity is high. In moist air, especially when the temperature drops, excess water vapor precipitates as very fine water droplets on the surface of microbes and dust particles. Their volume and weight increases, and the microbes and dust particles sink to the ground, vegetation and on other objects.

Light, especially direct sunray, has a lethal effect on microbes. Light causes drying out, decomposition and oxidation of substances, and so on to occur in the microbic cell and in the medium around it. These processes kill the microbes. The great oxidizing capacity of light is demonstrated by the example of decoloration of tissues and stained surfaces.

Thus, a few meteorological factors (low temperature, lack of wind, and lack of vertical aerial currents)can strengthen the damaging action of the bacterial weapon, while others (presence of wind, presence of vertical air currents, high grade of humidity, and so on) will lower this action.

II. PROTECTION AND DEFENSE OF THE POPULATION AGAINST BACTERIAL WEAPONS

The Principles of Protection and Defense Against Bacteria.

The bacterial weapon is apt to strike people, animals, and plants, if they are not protected from the penetration of the bacterial means. As a result of a bacterial attack, various diseases can develop simultaneously over a large territory, in people and in domestic and wild animals. It is therefore evident that people and domestic animals must be protected from injury and moreover, developed diseases must be rapidly eliminated. In the past, the inability to quickly eliminate foci of plague, cholera, smallpox, and other diseases, resulted in innumerable deaths. It is calculated that during the 14th century plague epidemic in Europe about 25 million persons died. According to the data of M. A. MOROZOV, in the European countries in the 16th and 17th centuries, not less than 150 million persons died from smallpox alone. In recent times, due to rapid isolation of the sick and other measures, these diseases have not substantially damaged the population, even in countries where these diseases are constantly reported. The defense of the population against bacterial weapons may utilize the same combined system of preventive and antiepidemic measures that is employed in the control of infectious diseases during peacetime. In wartime, however, combined system must be widened, considering the intentional infection of the people with agents of infectious diseases and the damage inflicted by bacterial toxins.

The following measures form the basis of an antibacterial defense:

1. utilization of personal and collective means of defense at the moment of bacterial attack;

2. rapid wholesale immunization of the population against the most dangerous infectious diseases;

3. taking steps of sanitary and hygienic nature (especially in the field of water supply, nutrition, and personal hygiene);

4. determination (detection) of the species of microbes and toxins being employed;

5. making timely arrangements for the localization and elimination of developed foci of bacterial infection.

Protection from the damage inflicted by bacterial agents at the moment of their employment can be provided only in a single combined system of defense against all means of wholesale destruction. At the same time, defense against bacteria is distinguished by a number of special features. First, a timely arrangement of preventive measures can ward off, or sharply limit, the effect of the bacterial weapon. Second, the quick localization and elimination of the sequelae of a bacterial attack is possible only with quarantine or observation.

Quarantine and observation make it possible to localize foci and to prevent the dispersion of developed infectious diseases beyond their boundaries. Therefore, immediately after a bacterial attack, even before the species of microbes employed has been determined, the establishment of quarantine is specified by order of the Chief of Civil Defense of the city (rayon).

Quarantine is a system of administrative medical and health measures which attempt to prevent the dissemination of an infectious disease from its place of origin. Quarantine is also needed for the control of infectious diseases in animals and plants.

In a quarantine system, it is necessary to isolate the focus of infection, to prohibit the exit from, and to limit strictly the entry into the focus, to prohibit the export of any property without a preliminary disinfection, and to limit the communication of the people in the focus.

If evidence of organisms responsible for plague, cholera,

or smallpox is not found, and if epidemic numbers of other infectious diseases do not arise, quarantine should be replaced by observation. Otherwise, quarantine must be maintained until the focus of bacterial infection is completely eliminated.

Observation is similar to quarantine, but it is less strictly enforced: --exit from the focus of bacterial infection through control posts is permitted, the communication among people inside the focus is less restricted, and so on. For instance, while quarantine completely prohibits communication between workers in different shops, in observation it is permissible. Property may be removed from an area under observation only after disinfection, just as in case of quarantine.

Quarantine and observation help the rapid elimination of infectious diseases only if the recommendations of medical workers are accurately followed by the population. In quarantine, the rules prohibiting exit from the focus and export of non-disinfected things should be strictly observed. This is necessary for two reasons. First, in abandoned foci without timely medical aid, the disease can take a severe course and have a lethal outcome. Second, in places where foci are found, the development of a new focus of ailments is inevitable. A knowledge of the history of dissemination of infectious diseases leads to such conclusions. Thus, all plague epidemics of monstrous size in the past were related to import of the infection by refugees traveling from one place to another.

A temporary stop of communication between people living at home, in the farmstead, and with workers in other shops has an extremely preventive importance. As a result of this simple measure during epidemics of plague, cholera, smallpox, and other diseases, individual blocks of a city have been known to remain free from sickness cases. It is characteristic that in afflicted blocks, those inhabitants who stopped

communication with the surrounding population never became infected.

Quarantine and observation require the participation of the population in executing such measures as elimination of the consumption of food and water suspected of infection, isolation of patients from other members of the family until the arrival of a physician, timely reception of vaccinations, disinfection of objects of the residential surroundings, conduction of partial and full sanitary processing, observance of the rules of personal hygiene, taking medical preparations to prevent the development of sickness in contaminated persons (special prevention), discovery and extermination of insects and rodents.

The duration of quarantine and observation depends upon the character of the infectious disease and upon the concrete situation. Quarantine and observation stop when a time equal to the maximum incubation (latent) period characteristic of the particular infectious diseases has elapsed after the recovery of the last patient, and when the required anti-epidemic measures have been completed in the focus of infection.

Role of the Population in the Defense Against Bacterial Weapons.

The idea of enlisting the aid of the population in controlling epidemics was born at the dawn of development of the Soviet State. In the severest devastation, during the Civil War and foreign intervention, epidemics of exanthematic typhus, smallpox, cholera and other ailments were eliminated quickly because of the mass effort to control infections.

The participation of the population in maintaining the sanitary system was evident in the years of the Great Patriotic War. The popular support of the efforts of public health organizations to execute preventive measures and eliminate outbreaks of infectious diseases rescued the country from epidemics, despite huge destructions in the occupied

regions, despite an intentional dissemination of exanthematic typhus by the Hitlerian usurpers, and despite the difficulties caused by the warfare.

During Soviet power, many forms of popular participation in controlling infectious diseases were devised: public control of the health conditions of schools, of dining rooms, warehouses (shops), hostels, and other buildings, farmstead rounds for the detection of sick persons, public cleansing of courtyards and village areas, organization of water sources, conduct of sanitary processing work, and eradication of small animals, rodents, etc., which may transmit infectious diseases.

The role of the population in the defense against bacterial warfare should be still more important than peacetime preventive measures, since in warfare the endeavor of the enemy to introduce diseases into the population must be paralyzed; this is much more complicated than the elimination of infectious diseases which break out under natural conditions.

Our country has at its disposal diverse means and methods of defense against bacterial agents of destruction. The timely and correct utilization of these means by the population makes it possible to fully exclude, or to sharply limit, the sequelae of a bacterial attack. It is for this reason that everyone should know the means and methods of antibacterial defense.

The organizations of the All-Union Voluntary Society for the Promotion of Army, Aviation and Navy, by the Union of Red Cross and Red Crescent Societies of the USSR, in coordination with the general public, train the population in the use of measures of defense against bacterial means of destruction. One can also acquaint himself with these measures of protection by taking advantage of consultations with medical workers. In personal training, special attention should be paid to the study of the following problems:

properties of the bacterial weapon, and methods of its employment;

personal and collective means of antichemical defense;

improvised means for the defense of the organs of respiration, vision, and of the skin;

methods of protecting dwellings, water, and food products from bacterial agents;

methods of disinfection for individual reserves of water, food articles, dwelling, and domestic articles;

system of performing partial and full sanitary processing;

methods of controlling insects and rodents;

rules of care for infectious patients;

rules of conduct upon being given Civil Defense signals.

In addition to a theoretical study of these questions, the population should secure improvised means of protecting the organs of respiration, vision, and the skin; it should take part in sanitary and hygienic arrangements, and so on.

Means and Methods of Protection and Defense Against Bacterial Weapons.

The means of protection and defense against bacterial weapons are customarily subdivided into specific and non-specific means. Each of these groups is further divided into personal and collective protection.

To the specific means of protection belong vaccines, immune sera, phages, antibiotics, and chemical preparations.

Vaccines make it possible to develop in man a non-susceptibility (immunity) to infectious diseases, or to ease the clinical course of a disease. Immunization (vaccination) is successfully used for controlling many infectious diseases. In the USSR and in many other countries, smallpox was eradicated chiefly by large-scale immunization. In our country, vaccinations make it possible to achieve outstanding successes in controlling poliomyelitis and diphtheria.

Immunization has a good effect in plague, tularemia, tetanus, and other diseases. Therefore, an important place in anti-bacterial defense is assigned to it.

The timeliness of immunization, and the involvement of the entire population in it depends greatly upon the organization of the population itself. Experience shows that, with popular support, inoculations can be performed in a short time.

Immunity does not develop immediately after inoculation with a vaccine, but after two to three weeks. The administration of an immune serum (gamma-globulin) results in an immediate, but brief (not more than a month) preventive and curative effect. Immunity after inoculations with vaccines lasts from several months up to several years. Sometimes, in case of a contamination with bacterial means, a simultaneous immunization of vaccine and serum can be made.

Phages, just as immune sera, are employed only in a few infectious diseases. They are most effective when in combination with immune sera, antibiotics, and chemical preparations.

Antibiotics and chemicals are suitable for the treatment of sick persons, but they also make it possible to prevent the development of disease in contaminated person, or to ease its course (special prevention).

Special prevention prevents the development of a disease if the curative preparations (antibiotics, chemical preparations, gamma-globulin) are taken according to a schedule indicated by the physician. With an early employment of these preparations, the microbes which fell into the organism find conditions which are unfavorable for their propagation. However, their multiplication stops at a certain minimum concentration of the preparation in the organism. Since the concentrations of these preparations in the blood and internal organs (liver, spleen, kidneys, and so on) drops comparatively quickly, they must be taken several times a day in prescribed doses. A special prevention will be ineffective

if the daily dose of the preparation is taken at once, and not in two-four-six doses as prescribed by the physician. Moreover, a definite time is required for the disappearance of microbes from the organism. Therefore, preparations should be taken for several days. The length of taking the preparations is established by the physician depending upon the type of microbes which entered into the organism, and upon other factors. A premature stop in taking the preparations is dangerous, since unkilled microbes can quickly multiply, and cause disease. In some cases, there is a resemblance to fire extinguishing. It is known that fire kept as a spark can grow into a flame which is hard to extinguish.

Special prevention methods are presently being used successfully in many countries for controlling plague, cholera, anthrax, botulism, and other diseases. For instance, a timely intake of streptomycin prevents the development of such a severe disease as pulmonary plague.

Specific precautions against bacterial weapons, when used at the appropriate time make it possible to protect each person separately (personal protection), and to bar or limit the spread of infectious diseases in the population (collective protection).

Non-specific means of protection against bacterial weapons are extremely diverse. They are subdivided into personal and collective means.

To the personal means of protection belong gas masks, means of skin protection, and the antichemical (antigas) packet. Gas masks of different constructions make it possible to protect not only the organs of respiration, but the skin of the face and the conjunctiva of the eye, too. For the protection of respiratory organs in care for sick persons, respirators of the "Lepestok" ("Petal") type and cotton-gauze dressings can be used.

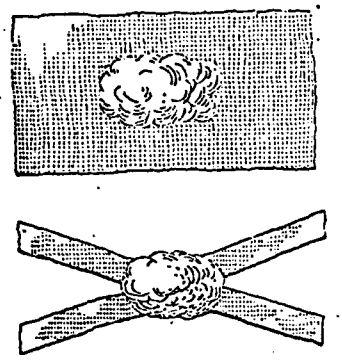

Figure 1.

Preparation of a cotton-gauze dressing.

For the preparation of a cotton-gauze dressing, a piece of gauze 125 cm long and 50 cm wide is taken. An even layer of cotton, 2 cm thick, 25 cm long, and 17 cm wide is placed in the center of the gauze. The cotton is then wrapped up in the gauze. The ends of the gauze are cut up from both sides so that they form ties. When a cotton-gauze dressing is applied, the lower ends of the ties are fastened on the head, while the upper ends are fastened on the nape (Figure 2).

Figure 2.

Correct application of a cotton-gauze dressing.

In an emergency, the bacterial agents' penetration into the respiratory organ may be reduced by use of a kerchief

rolled into several layers, a three-cornered neckerchief, a collar, or the flap of a topcoat. Improvised means of protection for the respiratory organs have the best effect if protective eyeglasses (goggles) are also used (Figure 3).

Figure 3.
Protection of face, eyes, hair with cotton-gauze dressing, goggles, and a three-cornered neckerchief.

Means of skin protection consist of the special isolating and filtering protective clothing (protective dress, protective overalls, pneumatic clothing), as well as capes, protective footwear (stockings), gloves, rubber high boots, aprons, jackets, and trousers. Improvised means can be also used --- capes and raincoats from oilskin, polyvinyl and chloride pellicles; topcoat; quilted jackets; leather boots or rubbers (galoshes); leather mittens or gloves, and so on. Women are advised to put on trousers.

Infants in arms may be protected by various portable boxes, in which air enters through the ordinary canister of a gas mask with the aid of bellows or other applicances. Small gas masks are available for older children. In absence of personal means of protection, small children should be wrapped in bedsheets and covered with blankets.

Shelters equipped with antigas defenses are reliable

means of collective protection. They may be constructed as independent buildings or set up in basements (cellars), subways, mine excavations, and so on. Simple covered positions (trenches, blindages, recesses, and so on) can be utilized for a short time at the moment of an air raid, but without personal means they do not provide full protection from a bacterial strike.

Sanitary hygienic arrangements, many of which are simple and accessible are very important for protection from bacterial weapons. Sanitary hygienic measures do not permit protection from contamination at the time of a bacterial air raid, but only subsequently; these measures can help in preventing infection through contaminated hands, water, food and other objects of the external environment.

It is known that, under ordinary conditions of human life, hygienic measures (hand washing, regular washing of the body with change of the underwear, use of personal utensils and clothing objects, maintenance of the cleanliness of dwelling, of clothing, and so on) will limit the spread of many intestinal infections (abdominal typhoid fever, dysentery, paratyphoid fevers, and so on), many infections of the external covers (scabies, trachoma, favus, and so on) and such other infections as exanthematic and recurrent typhus fever. Therefore, the natural role of these measures is understood in bacterial warfare.

Sanitary hygienic measures in the sphere of water supply and nutrition are very important, since different infectious diseases can be disseminated through water and food. Especially dangerous is the contamination of a water source which is used by a large number of peoples. In the past, as a result of the consumption of tap water contaminated with abdominal typhoid and cholera, hundreds even thousands of people became infected and sick in a short time. Therefore, protection of water sources, storage of water in packing

containers with covers, and disinfection of water by available methods (boiling, chlorination) are important methods of protection against bacteria.

Under domestic conditions, food products can be protected from contamination by various methods. Groats, flour, sugar, and other dry products in small amounts are best kept in glass or metal jars. Bread, meat, butter, and vegetables should be stored in sacs of oil-cloth, of tarpaulin, and of different synthetic impermeable materials; refrigerators, tightly closed chests, buckets and pans with lids can be used. Products preserved in metal or glass pots are best put away in cupboards or in cases, or covered with oilcloth, tarpaulin, and so on.

Protection against bacterial means is provided by the disinfection of clothes, of footwear,of dwellings and industrial premises, of furnitures, of the area, and of the transport vehicles, of the personal means of antigas protection, disinfection of water, of food products, of ready meals, and of other objects, as well as the sanitary processing of the segment of the population directly in the focus of destruction.

Various means and methods of disinfection can be used. The characteristics of a few widely spread means are compiled in Table 1.

Clothes, linen, beddings and other objects made of fabric which permit boiling and soaking in disinfectant solutions can be disinfected by one of these methods. Mattresses can be rinsed, or rubbed through with a 3% solution of chloramine or lysol. The most reliable disinfection of soft articles is a treatment in special disinfecting chambers. Footwear can be disinfected by a rub-off with a 5% lysol solution.

Disinfection of walls, floors, and ceilings can be done by thoroughly rubbing them with old rags moistened with a 10% solution of chloramine, 10% hot lysol solution, or by irrigating them by spraying the mentioned agents (Figure 4). This treatment is carried out three times, at 15 - 20 minute

Figure 4.
Disinfection of the ceiling by rubbing it with an old rag soaked in a disinfectant solution.

intervals. Another reliable method of disinfecting walls and ceilings is double whitewashing with a freshly prepared solution of unslaked lime.

Depending upon its nature (whether metal, wood, etc.), furniture is disinfected by different methods. Upholstered furniture is best cleaned with a vacuum cleaner, and afterwards rubbed thoroughly with a clean duster, or brush, moistened with a 3% chloramine solution. For the disinfection of wooden, metal or plastic furniture, it is rinsed and rubbed thoroughly with a disinfectant solution. The old rags, dusters, and pieces of bast used in the disinfection, as well as the sweepings, must be burnt. Utensils, rubber articles, and plastics can be boiled or soaked in a disinfectant solution (Figure 5).

Figure 5.
Disinfection of utensils and
other objects by boiling.

The population can also be recruited for the disinfection of areas, external surfaces of buildings, edifices (structures), and transport vehicles.

The area is first disinfected in places where many persons are living (courtyards, streets, public places, squares, sectors adjacent to stores, warehouses, enterprises, medical establishments, and so on).

In hot weather the area is disinfected with a 20% milk of chlorinated lime (2 Kg chlorinated lime per one bucket of water), or with a 10 - 20% solution of two-third basic calcium hydrochlorite salt (DTS-GK). When the contamination is due to non-sporebearing microbic forms, a 20% milk of chlorinated lime or a 10% DTS-GK solution is used as disinfectant, using 1 liter per 1 m^2 of surface area. When the contamination is by sporebearing microbic forms, the same disinfectants are used at the rate of 2 liters per 1 m^2.

In calm weather, dry chlorinated lime can be used at the

Table 1.

DISINFECTANTS AND METHODS OF THEIR USE.

Name of disinfectant	External form	Concentration of working solution %	Method of treatment
1	2	3	4
Chlorinated lime	White powder of chlorine smell	10-20; milk of chlorinated lime	The patient's excreta are mixed with a double amount of the solution.
The Same	The same	10; clear solution	Linen is soaked for 1 - 2 hours
The Same	The same	0.2-0.5; clear solution	Walls, ceiling and floors are rubbed or copiously irrigated with a sprayer
Chloramine	Yellowish crystalline powder	0.5	Linens, clothes, means of protection of the skin are soaked for 1 hour
The Same	The same	2	Open parts of the skin are treated by rubbing
The same	The same	3	Linen, contaminated with excreta of patients is soaked for 1 hour
The same	The same	5	Excreta of patient poured down with double amount of solution
The same	The same	10	Walls, ceiling, and floors are irrigated

Table 1 continued

1	2	3	4
			three times at intervals of 15-20 minutes
Lysol	Reddish brown oily liquid	3	Linen is soaked for 1 hour, bed-pans for 2-3 hours
The same	The same	5-10	Walls, ceiling, floors, furniture (except polished furniture) are irrigated three times at 15-30 minute intervals
I-chloro beta-naphthol	Yellowish or white crystalline powder Issued as dark paste mixed with potash soap	0.2-0.5	Walls, ceiling, floors are irrigated at the rate of 300-900 ml per m^2. Vessels are soaked for 1 hour, linen for 2 hours
"Hexaphen" soap	Ordinary toilet soap containing 5-10% of the preparation		Hands are washed as usual for 15-20 seconds until foaming
Benzyl chlorophenol	Dark thick liquid	0.5-1	Linen, vessels, are soaked for 1 hour, surfaces irrigated abundantly
Sodium hydrometasilicate	White crystalline powder	3-4	Walls, floors, ceiling and furniture are rinsed abundantly
		1	Linen without visible dirt soaked for 10 min.

Table 1 continued

1	2	3	4
		3	Linen dirty with excreta soaked for 10 minutes
		1.5-2	Utensils, toys are immerged in the solution for 5 minutes.

rate of 0.5 Kg per 1 m^2 of contaminated surface. The area is sprinkled with chlorinated lime, then flooded with water, using 1 liter per 1 m^2.

Unpaved ground can be disinfected by removing 3 - 5 cm from the top layer with a shovel, or by using a bulldozer to the depth of 7 - 8 cm. The removed ground is taken beyond the boundaries of the village to a specially designated place, and is treated on its surface.

For the disinfection of toxins, 10% aqueous solutions of caustic soda, or of sodium sulfite, are suitable. They can be used in hot or cold weather, but one should remember that the solutions of both substances destroy fabrics and footwear.

In winter time the area is disinfected with a 50% solution of sulfuryl chloride or with a 10% solution of dichloramine in dichloroethane (= ethylene dichloride) at the rate of 1 liter per 1 m^2 of surface area, if the contamination was with non-sporebearing microbic forms. For the disinfection of sporebearing forms of microbes, the amounts of solutions should be doubled.

Microbes can be removed mechanically from the surface of snow. From a compact snow cover, a layer 3-4 cm is removed, and from loose snow a layer of 20 cm is taken. The removed snow is carried out beyond the boundaries of the

village.

The external surfaces of buildings and edifices are disinfected in places with which a person can come in contact. For the irrigation of walls, 10% solutions of chloramine and chlorinated lime are suitable. The irrigation is carried out three times at 15-20 minute intervals. Each irrigation uses 0.3 liter of the solution per 1 m^2 of contaminated surface area. Disinfection of walls is easy with the aid of a sprinkling pump (Figure 6).

Figure 6.
Disinfection with the aid of a sprinkling pump.

After washing the walls, the area around the building must be treated with disinfectant solution.

Special platforms are adjusted for the disinfection of transportation vehicles. In cases of contamination with non-sporebearing microbic forms in hot weather, a 2% - 5% clear chlorinated lime solution, a 3% chloramine solution, or a 5% lysol solution is used. In winter time, a 10% solution of dichloramine in ethylene dichloride is used. For the disinfection of sporebearing microbic forms, a 10% chloramine solution is used in a 17%-20% solution of formaldehyde.

Contaminated surfaces in rooms are irrigated and

thoroughly rubbed with the use of brushes, old rags, dusters, soaked in a disinfectant solution.

Water taken from open water sources, uncovered wells, and lidless containers (bucket, tank, barrel, and so on) must be disinfected in wartime. The most reliable method of disinfecting water and vessels in which water is stored is boiling for 30 minutes. The sporebearing forms of microbes are killed after this time, and bacterial toxins are destroyed.

In households, food products are disinfected by various methods.

Preserves in metal and glass jars can be used only after disinfection of the container. For this purpose, they are placed in a pan or a bucket of water, brought to a boil, and are boiled for 30 minutes. Metal boxes can be immediately put in boiling water.

A metal and glass container, as well as a package made of synthetic films, cardboard, thick paper and wood (barrel, case) can be disinfected by rubbing them three times (at 15-20 minute intervals) with a 5% chloramine solution or with a 5% clear chlorinated lime solution. After rubbing the container with a disinfectant solution (except paper and cardboard wrappings, which are burnt), washing with boiling water is recommended. Paper and cardboard wrappings must be removed so that their external surface does not come in contact with the products.

Food products preserved without wrapping are disinfected by boiling. This method is good for the disinfection of meat, fish, fats, sugar, salt. Sugar and salt are suitable for use after boiling down, or as salty and sweet solutions. Disinfecting bread is rather complicated. If it is known that sporebearing microbic forms and toxins have not been used, the bread can be sliced and roasted in an oven or stove. Otherwise, the bread must be washed, thoroughly boiled, and the obtained mass can be utilized for a second

baking. Here, consultation of medical workers and bread-baking specialists is obligatory.

During disinfection, it is best to use means of personal protection (gas mask or cotton-gauze dressing, goggles, dressing gown, gloves, rubber high boots or other footwear with galoshes). After completion of the work, the protective clothing must be thoroughly disinfected and most go through a full sanitary processing.

In many cases, parallel to the need for disinfection may develop the need for disinsection (Killing of insects) and rat extermination (killing of rodents). Many insects (lice, fleas, flies, mosquitoes, culicids, and so on) are carriers of infectious diseases. Therefore, their destruction aids in preventing the dissemination of infection. Control of insects must go on, regardless of the presence of infectious diseases, by utilizing sanitary hygienic and exterminating measures. Sanitary hygienic measures (bathing not less than once in 7 to 10 days, maintenance of house cleanliness, and of a clean surrounding area) in themselves prevent or at least limit, the appearance of such insects as lice, fleas, flies, and cockroaches.

Mechanical, physical, chemical, and combined methods are used for the destruction of insects.

Mechanical methods (beating out, shaking out, laundering, removal of dust and rubbish, cleaning of the area) are the most effective against fleas and flies. To keep flies, culicids and mosquitoes from flying into rooms, it is best to cover windows and doorways with a metal screen or gauze. Flies already in the room can be caught with the aid of a sticky paper, or they can be destroyed with disinfectants, and the latter can also be used against other insects.

Among the physical methods for the destruction of lice and fleas in body linen and bedding, boiling and ironing are used in households. Wallpaper fallen from walls infected

with bedbugs, rubbish, and insects poisoned with chemical agents are burnt.

The characteristics of the most widely used chemical disinfectants are given in Table 2.

In households, combined methods are often used; mechanical and physical methods are simultaneously employed for the destruction of insects.

For protection from insect bites, repellents have been lately distributed on a large scale. To such substances belong dimethylphthalate, kiuzol, and others. The skin of the face, neck, hands, and feet is smeared with repellents; the repellents are also applied to the collar, the lower part of sleeves, trousers, skirts, or used for the impregnation of protective screens. These means give protection from insect bites for a few hours.

Rat extermination is done with the aid of mechanical contrivances (traps of various types) and chemical preparations. Other methods are used less frequently. Measures of extermination must be combined with preventive measures (closing up holes in the floor, storage of food products and water in containers which are not accessible to rodents, weekly cleansing of basements and other places of rodent habitation, timely removal of rubbish and refuse from the area, and so on).

Mechanical means for rodent extermination are of various forms. In households spring traps and self-catching snares are rather frequently used (Figures 7 and 8).

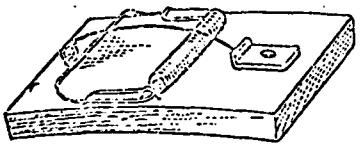

Figure 7.
Presser with surface for bait.

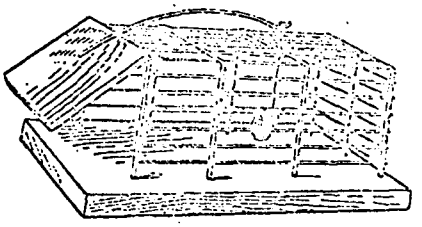

Figure 8.
Trap for live catch.

Table 2.

CHEMICAL DISINFECTANTS AND METHODS OF THEIR USE

Name of the preparation	Form in which it is sold on the market	Concentration of the preparation in the working solution, %	Method of treatment
DDT	10% powder		For destruction of lice, and fleas, body wear, bedding, clothes are dusted form the inner side. At the same time, it is rubbed into parts of the body covered with hair. For the destruction of flies, fleas, culicid insects, bedbugs and other insects in a room, it is sprayed on their settling places with the aid of manual or other sprayers.
The same	20-50%paste-emulsion	0.1-5	For the destruction of insects outside a room the solution is sprayed at the rate of 0.1-3 g of active substance per

Table 2 continued

Name of the preparation	Form in which it is sold on the market	Concentration of the preparation in the working solution, %	Method of treatment
			1 m^2; in a room... 2 g per 1 m^2 of surface area.
The same	The same	1 - 2	Linen is soaked for 30 min., wrung out, dried out, and lightly ironed. Top clothing is irrigated or rubbed off thoroughly
The same	40 - 65% emulsion-suspension	1 - 2	The same.
The same	DDT soap 5% or more		Washing the body, laundering linen.
The same	70% DDT insecticide crayon		Linen, clothing, beddings, walls, furniture, and so on are marked with the crayon at 4 cm distances.
The same	Phreon flasks		A 1 liter flask is used to treat 500 m^2 room or vegetation.
Hexa-chlorocyclo-hexane (HCCH)	6% dust		The same as DDT dust

Table 2 continued

Name of the preparation	Form in which it is sold on the market	Concentration of the preparation in the working solution, %	Method of treatment
The same	20% mineral-oil emulsion	2	For treatment of a room at the rate of 2-3 g active substance per 1 m^2 of surface area. For treatment of linen, clothes it is rarely used.
Chlorophos (DETF)	Crystalline substance containing 30-97% of active principle	2 - 3	For destruction of flies, fleas, bed-bugs and other arthropods, the aqueous solution is sprayed at the rate of 100 ml per 1 m^2 area.
	5 - 10% dust		For destruction of flies, fleas, bed-bugs and other arthropods, it is sprinkled in their settling places with the aid of manual portable sprayers.
Solvent naphtha	Clear preparation		For destruction of insects, articles are irrigated, placed

Table 2 continued

Name of the preparation	Form in which it is sold on the market	Concentration of the preparation in the working solution, %	Method of treatment
			in sacs or a thick box for 8-10 hours. In a room, places of accumulation of insects are rinsed, and it is closed for 3-4 hours.
The same	Soapy solvent naphtha paste (65 pts of solvent and 35 pts of green soap)	10-20	Linen is submerged in a 10% hot solution of the emulsion for 20-30 min., then washed. The 20% solution of the emulsion is rubbed in the place of hairy skin and washed off after 15 minutes.

Chemical preparations are used as poisonous baits: the preparation is admixed to a food article which rodents consume willingly. The baits are dispersed in places frequently visited by rodents (Figure 9).

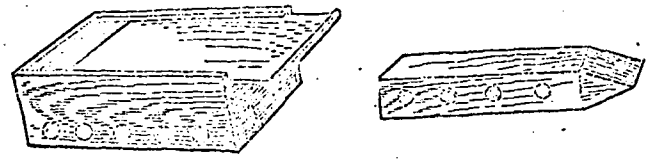

Figure 9.
Box for the dispersion of
poisoned baits.

The main data on chemical poisons used for the destruction of rodents are given in Table 3.

Table 3.

CHEMICAL MEANS FOR RAT EXTERMINATION

Name of the preparation	External form	Content of poison % (in weight of bait)	Mode of introducing the preparation into the bait
Krysid (= ANTU; naphthylthiourea)	Gray powder	up to 1	Mixed with bread crumbs, porridge, ground meat made from meat and fish.
Zinc phosphide	Dark gray powder	3	Mixed with bread crumbs, porridge, ground meat from meat and fish, andadded to water at the rate of 500 mg of the preparation per 100 cm^2 of water surface.
Thallium	White	3-5	Mixed with bread crumbs and

Table 3 continued

Name of the preparation	External form	Content of poison % (in weight of bait)	Mode of introducing the preparation into the bait
sulfate	powder		other food products.
Scilla maritima	Yellowish amorphous powder	20	Mixed with one of the food products or baits are soaked with Scilla extract.

Baits with chemical poisons are used in freshly prepared form. In a bait made from bread crumbs or mush, a vegetable oil is best added (0.25% of the weight of bait).

For the prevention of the spread of infectious diseases, the sanitary processing is especially important. Depending upon the combat situation, it can be partial or full.

Partial sanitary processing is performed by the contaminated person himself immediately after a bacterial attack. It consists of the removal of bacterial means from the open parts of the body (face, neck, hands) and from those parts of the clothing which the contaminated person touches more frequently. A partial sanitary processing is best done in the following order: rub the face, neck, hands, and then the clothing and footwear with a rag or pocket handkerchief soaked with the liquid of the personal antigas packet. Less effective is the washing of open parts of the body with water and soap, and the mechanical cleansing of clothes without the use of a disinfectant.

Full sanitary processing includes the disinfection of open parts of the body with disinfectant solutions, washing the body with hot water and soap, disinfection of the under-

wear, clothes, footwear, and of the personal means of protection in stationary or mobile chambers.

Full sanitary processing is carried out in specially deployed or stationary decontamination points.

Full sanitary processing is possible in a communal flat when bathtub or shower is available. In this case the contaminated articles are placed in a bag, and sent for decontamination to a disinfection chamber, or they are disinfected at site with the aid of boiling or soaking in a solution of the disinfectant.

Protection Against Bacterial Weapons in Households, Enterprises, and Establishments

The primary cells of protection from the bacterial weapon should be the apartment, the house, the hostel, the works plant, the factory, the establishment, and the educational institution. Pensioners, housewives and juveniles can do much for the preparation of an apartment house for protection against the bacterial weapon.

Important measures include cleansing the dwelling, complying with the rules of personal hygiene (washing the hands with soap after work and before food intake, washing the body not less than once every 7 to 10 days with change of underwear and bedding, cleansing the external clothes with a brush, cleaning the footwear before entering a room), good construction of the sources of water supply, keeping food articles under conditions which prevent the access to flies and rodents, cleansing the courtyard area, exterminating insects and rodents with the available methods.

Sanitary hygienic measures make possible the peacetime prevention of infection and limitation of the spread of many infectious diseases. Experience with the control of infectious diseases proves that sanitary hygienic measures bring especially good results in combination with immunization.

When the threat of a bacterial attack appears, windows and doorways must be sealed airtight, and small household

articles (books, personal footwear, clothes, and so on) must be covered by any of the available methods. Special attention must be paid to the protection of personal reserves of water and food articles. By using existing capacities (buckets, tanks, tubs, pans) a water reserve for washing and disinfecting the room should also be built up.

Personal means of protection (improvised means of protection of the organs of respiration, vision, and of the skin) must be available. The locations of shelters and concealments and Civil Defense signals must be known in advance for their effective use. Knowledge and skill facilitating quick use of personal and collective means of protection are important conditions in the defense of the population against bacterial weapons.

In case of a bacterial attack, under household conditions, chief attention should be paid to the execution of partial and full sanitary processing, disinfection of the dwelling and furniture, and decontamination of food articles and water. Citizens who were away from shelter and without means of protecting their organs of respiration, vision and their skin, should receive means of special prevention as prescribed by medical workers.

Even the most perfect protection may be vulnerable tc some degree; it is therefore impossible to entirely exclude the possibility of the appearance of illness subsequent to a bacterial attack. The occurrence of an illness must be reported immediately to the nearest medical establishment, and the patient should be isolated.

After the examination of the patient by a physician, depending upon the nature of the infectious disease and upon the actual situation, a sick person can be hospitalized or left at home for treatment.

During home treatment, the patient must be kept in a separate room. If this is not possible, his bed must be isolated with a screen, curtain or bedsheet.

The care of a patient is best charged to one person. As a rule, the patient should have separate utensils and personal objects.

For the decontamination of utensils (vessels), spittoons, bed pans, urinals, pans, and other objects of nursing care, solutions of disinfectants or boiling water can be used. Underwear and bedding can be decontaminated in the same way. Excretions of the patient (phlegm, feces, urine) and remainders of food should be also subjected to disinfection before their removal to the sewer, or to the outhouse in the courtyard. It is advisable to build up a small reserve of disinfectants in advance. For the avoidance of contamination while nursing a patient, these measures of prevention should be observed: use a smock and a cotton-gauze bandage, wash the hands with soap, and do not permit the patient to be visited by next-door neighbors or relatives.

After recovery or transfer to a hospital, the bedding and underwear of the patient are placed in a sack and sent to a chamber for disinfection, or they are decontaminated at site with the aid of boiling and soaking in a disinfectant solution. The utensils, objects of nursing, and other articles which contacted the patient should be also decontaminated.

Protection of the population against bacteria during their work in a plant, in a factory, in an establishment, and so on, does not differ substantially from protection at home. Protection can be assured by execution of the combined set of sanitary and hygienic measures, by immunization, by using personal and collective means of protection, and by timely eradication of the sequelae of a bacterial attack.

The importation of infectious diseases to enterprises and establishments is especially dangerous, since it may result in the simultaneous infection of many people. All measures of antibacterial protection should therefore be carried out especially accurately in a large collective.

Conditions for carrying out measures of protection are more favorable here than at home, since there are many possibilities for outfitting shelters and concealments, for creating reserves of personal means of protection, for immunization, for special prevention, for disinfection, for partial and full sanitary processing, and so on.

The maintenance of health regime in the production rooms and subsidiary rooms is important. All rooms must be sealed airtight for protection from bacterial aerosols.

At both enterprise and residence, hands must be thoroughly washed after work and before eating, and other rules of personal hygiene must be observed. For this purpose, it is best to enlarge and to equip lavatory rooms, to adjust places for the storage of disinfectant solutions, brushes and soap.

In work rooms and in places temporarily occupied by people (clubs, factory moving picture theaters, halls for physical exercises, libraries, and so on), water should be introduced: small fountains be set up, or barrels be installed with drinking water, so that the consumption of water from casual water sources be eliminated.

In shops and other service rooms, considering the number of workers, there must be a medicine chest with a reserve of antibiotics, chemical preparations, and other medical and preventive means.

During routine and major repair of household stores, kitchens, mess halls, buffets, storehouses, and so on, according to a plan prepared in advance, provision should be made for the storage of products, utensils and kitchen devices which prevent bacterial means from falling into food products and ready meal; provision should also be made for tightly closed cabinets, airtight sealing of counters and vehicles for transfer of products, installation of autoclaves, arrangement of lids on kitchen kettles, and so on. Strangers should not be allowed to stay in the room where food is prepared and food articles are kept. Moreover, the health of persons working

in the kitchen, in the dining hall and at the food storage room should be constantly observed.

Immunizations in work plants, factories, establishments, and teaching institutions should be performed in as short a time as possible and including the largest possible number of workers.

In eliminating the sequelae of the use of bacterial means, the spread of infection beyond the boundaries of the building must first be prevented. Immediately after establishing the fact that a bacterial weapon was used, exit and exportation of material from the stricken area, and entrance to it is stopped. Exit and entrance of transportation is authorized only after decontamination of the area and the buildings and structures, and after making many other special arrangements.

Until the determination of the type of bacterial means employed, it is best to limit the contact of people working in different shops.

If an object is removed from the area of contamination, all people affected are obliged to pass through special prevention and full sanitary processing, with disinfection of linen, clothes, shoes, and means of personal protection.

Sick persons are sent to hospitals for infectious diseases, or they are placed in dispensaries deployed on the area of the enterprise.

Patients with specially dangerous infectious diseases (plague, smallpox, cholera) cannot be evacuated from the zone of contamination.

Disinfection of a contaminated area, is carried out in the following sequence: first, decontaminate the transport vehicle, and the external surface of buildings and structures; after this, disinfect the interior of rooms.

Decontamination of food products can be done in various ways, depending upon the product, the nature of wrapping, and the type of microbe employed.

In an organized collective as in households, Civil

Defense formations play the chief role in the arrangement of protective measures. Cooperation of the population with the detached forces of Civil Defense in the work which the force carries out is a sine qua non of success in anti-bacterial defense.

THE CONCEPT OF THE IDENTIFICATION OF THE BACTERIAL MEANS OF CONTAMINATION

"Detection and identification" is the accepted phrase for the aggregate of different methods by which the fact can be established that a bacterial weapon was used, and which makes it possible to determine the species of microbe or toxin used.

Timely discovery of the employment of a bacterial weapon and determination of the species of microbes and toxins utilized determine to a considerable extent the nature and specific direction of arrangements to eliminate the focus of bacterial contamination. Foreign specialists therefore think that the effectiveness of antibacterial defense depends to a large extent upon the effectiveness of indicative methods.

Detection and identification are usually divided into specific and non-specific.

The simplest method of non-specific recognition is a visual observation of the terrain. When observation is performed continuously, the use of a bacterial weapon can be suspected from many signs. The literature points out the need for considering such signs as formation of a cloud following the drop of rockets or other delivery devices of bacterial means of destruction, discovery of separate parts of unusual ammunitions (sprayers, reservoirs, and so on), presence of dusty substances and liquid drops on the ground, on the vegetation and on various objects, and so on. Visual observation is not very efficient at night, or when meteorological conditions restrict visibility. Moreover, results of visual observations cannot be used without verification. When dust-like substances, liquid drops, cadavers of animals, fragments of ammunition, and so on are found, findings of

chemical and radiological reconnaissance, conclusions of an epizootologist, and technical expert examination are still necessary.

Other non-specific methods of recognition are more accurate. Foreign laboratories have recently been using electronic instruments which are based upon different chemical, optical, serological, and other methods.We already have devices which allow the rapid determination of the number and the size of particles suspended in the atmosphere, and give the characteristics of these particles. Methods for rapid detection of bacterial means in water, food products, and so on are also being developed.

Specific methods for the detection of bacterial means can be subdivided into the following phases: 1. selection and delivery of samples to the laboratory; 2. preparation of the samples for examination; 3. cultivation of micro-organisms and determination of their species.

Samples of air, water, food products, excretion of contaminated and sick persons (smears from the nasopharynx, phlegm, vomited mass, blood, feces, urine, and so on), are examined.

The population can also participate in the process of detection. After noting the location in which bacterial rockets were dropped or containers filled with insects, accumulations of flying and crawling insects, rodents, small animals at separate parts of the terrain, coatings of dust or liquid drops of different character on grass, trees, building walls, and so on were discovered, the administration of the enterprise or the establishment should immediately report to the militia or to the medical establishment. This report will have great importance in determining whether a bacterial weapon was used, and in the timely execution of antibacterial measures.

CONDUCT OF THE POPULATION AT CIVIL DEFENSE SIGNALS

The skillful use of personal and collective means of protection by the whole population is an indispensable condition for successful protection from bacterial weapons, just as it is in the case of other means of large-scale strike.

In the event of a threatened or real enemy attack, Civil Defense signals will be given. These signals must be known and recognized quickly, and one must respond to them correctly.

For protection from bacterial weapons, the following signals must be known: "Aircraft warning" [Russian abbr.: "VT"], "Gas attack" [Russian abbr.: "KHN"], "Bacterial Contamination" [Russian abbr.: "BZ"], and "All-Clear."

"Aircraft warning" warns of immediate danger of the enemy's use of means of large-scale striking, including the use of a bacterial weapon. For presenting an "Aircraft warning" signal, acoustic means (sirens, and factory, work plant, locomotive and steamer whistles), radio transmissions and television networks can be used. The latter delivers the signal as an announcement.

At the signal "Aircraft warning," the personal and collective means of protection must be used calmly and in an organized manner with the understanding that in making an air attack the enemy can employ any one of the mass annihilation weapons.

The signal "Gas attack" warns the population about the use of poisonous chemical substances and bacterial means of attack by the enemy. This signal is presented by an alternation of long and short whistles for one to two minutes, as well as by a simultaneous announcement by radio and television networks. The signal can be also presented by frequent bangs on a rail by striking bells, and so on. Each citizen should don the means of personal protection. Persons hearing this signal at home, at work, or in establishments

should fulfill all arrangements for airtight sealing of rooms and the protection of water and food products. Protective clothing must be put on, and one should go to the nearest shelter.

The "Bacterial Contamination" signal is presented similarly, with all types of notification to the population -- radio, television, whistles, and simple sound devices. This signal warns the population of the enemy's use of bacterial weapons. In acting at the signal "Bacterial Contamination," just as also after the signal "Gas attack," the personal means of defense and prevention which were discussed in detail above, must also be used in response to the signal "Bacterial Contamination."

After the signals of "Gas attack" and"Bacterial contamination," people who happen to be in shelters equipped with antigas and antibacterial protection will remain there.

No one may enter or leave the shelter during this time. People who heard the signals "Gas attack" and "Bacterial contamination" while on the road, in a transport vehicle, on the street, in the field, or in other places, can avoid contamination or can diminish its effect, by the use of personal means of protection and of simple shelters (basement, slit trench, cellar, natural deep sites --- caves, old shafts, adits, and so on).

After the immediate danger of air attack has passed away (if there was no attack), the "All Clear" signal is presented by radio and television networks. This signal means that people can leave the shelters and concealments.

The "All Clear" signal is not presented in the focus of a bacterial contamination. The population may come out of the shelter only by the decision of the shelter's duty officer. Before leaving a shelter or concealment in an area contaminated by bacterial means, one must put on a gas mask, protective stockings, gloves, and cloak. If there are no personal means of antigas protection, improvised means must

be used for the protection of the organs of respiration, vision, and the skin.

If passing through a contaminated area, precautionary measures must be taken: depart only along the indicated route, after leaving the contaminated area disinfect the residence or the service room by a partial and later by a full sanitary processing.

During the years of Soviet Government, our country achieved outstanding successes in controlling infectious diseases. In a historically short period, such diseases as smallpox, malaria, plague, and glanders were eliminated, and everywhere the morbidity rate of infectious diseases dropped markedly. Many data are presently available in the USSR for a still more successful attack on infectious diseases. Year after year, the material living conditions of Soviet people are improving; a ramified system of sanitary epidemiological posts and institutes was created, and native science is equipping the public health service with new, more efficient means of prevention, detection, laboratory diagnostics, and treatment.

Success achieved in the control of infectious diseases in peacetime is one of the most important conditions for an efficient defense of the population against bacterial means of contamination in case of an enemy attack.

In the interests of strengthening the defense capabilities of the country, each Soviet citizen should know the means and methods of protection against bacteria.

CONTENTS

This pamphlet describes ~~in a popular manner~~, the injurious properties of bacterial weapons, on the basis of an analysis of material published in the foreign press. Attention was especially paid to characteristic methods and means of protecting the population against bacteria.

This pamphlet is intended for a wide circle of readers.